



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/555,714

07/27/2006

Jorg Kowalczyk

P/2107-285

9742

2352 7590 08/24/2010
OSTROLENK FABER GERB & SOFFEN
1180 AVENUE OF THE AMERICAS
NEW YORK, NY 100368403

EXAMINER

BLAND, LAYLA D

ART UNIT

PAPER NUMBER

1623

MAIL DATE

DELIVERY MODE

08/24/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|---|--|
| Office Action Summary | Application No. 10/555,714 | Applicant(s) KOWALCZYK ET AL. | |
| | Examiner LAYLA BLAND | Art Unit 1623 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 11-33, 35-46 and 73-81 is/are pending in the application.
- 4a) Of the above claim(s) 14, 15, 19, 20, 39-42, 45, 46 and 76 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-13, 16-18, 21-33, 35-38, 43, 44, 73-75 and 77-81 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/28/2010, 6/16/2010</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

This Office Action is in response to Applicant's request for continued examination (RCE) filed June 16, 2010, and amendment and response to the Final Office Action (mailed January 4, 2010), filed June 16, 2010 wherein claims 1 and 23 are amended and claims 10 and 34 are canceled.

Claims 1-9, 11-33, 35-46, and 73-81 are pending. Claims 14, 15, 19, 20, 39-42, 45 and 46 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on March 4, 2008. Claims 1-9, 11-13, 16-18, 21-33, 35-38, 43-44, 73-75, and 77-81 are examined on the merits herein.

In view of the cancellation of claims 10 and 34, all rejections made with respect to those claims in the previous office action are withdrawn.

The following rejections of record are maintained.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9, 11-13, 16-18, 21-33, 35-38, 43-44, 73-75, and 77-81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Biella et al. (Journal of Catalysis, 206, 242-247, 2002, PTO-1449 submitted November 4, 2005) in view of Fuertes et al. (US 4,985,553, January 15, 1991, PTO-1449 submitted November 4, 2005) and Biella et al. (Catalysis Today 72 (2002) 43-49, PTO-1449 submitted November 4, 2005).

Biella et al. (Journal of Catalysis) teach the selective oxidation of glucose to gluconic acid using gold on carbon catalyst [see abstract]. The particle size was 2-5 nm and the support had a final gold loading of about 1 wt% [page 243, 2.2.1]. Reactant/metal ratio was about 1000. Experiments were done by bubbling dioxygen through an aqueous slurry, at atmospheric pressure (1 bar), at pH 7, 8, or 9.5, at 323 K (about 50°C). When the pH was not controlled, experiments were done at 30 kPa (3 bar) and 363 K (90°C) [page 243, 2.3]. Very high (>99%) selectivity was obtained [page 246, 3.3]. The gold catalyst has improved activity and selectivity over palladium or platinum catalysts [page 242, Introduction].

Biella et al. do not teach oxidation of oligosaccharides such as the elected species maltose, and teach carbon support instead of metal oxide solid support.

Fuertes et al. teach a process for selective oxidation of di-, tri-, oligo-, and polysaccharides using an oxygen-containing gas in the presence of a noble metal

Art Unit: 1623

based catalyst such as palladium, platinum, rhodium, or osmium on solid support [see abstract]. Disaccharides such as lactose are contemplated [column 2, lines 1-16]. Solid supports including alumina and titanium oxide are taught [claim 16]. The quantity of catalyst used should be between 0.005 and 1 wt% with respect to the polysaccharides [column 3, lines 58-63]. The reaction temperature should be between 20°C and 90°C [column 3, lines 65-68]. The pH should be between 7.5 and 11.0, preferably between 8.0 and 10.0 [column 4, lines 13-15].

Biella et al. teach application of gold catalysts to selective liquid phase oxidation, using SiO₂, Al₂O₃, TiO₂, or C as solid support [page 45, Table 1]. Oxidation of glucose is taught. Glucose/M was 1000 [page 48, 3.5].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to oxidize maltose using the method of Biella et al. (Journal of Catalysis), and to modify that method to include solid supports such as Al₂O₃ or TiO₂ in place of carbon. The Supreme Court in KSR reaffirmed the familiar framework for determining obviousness as set forth in *Graham v. John Deere Co.* (383 U.S. 1, 148 USPQ 459 (1966)), but stated that the Federal Circuit had erred by applying the teaching- suggestion-motivation (TSM) test in an overly rigid and formalistic way. KSR, 82 USPQ2d 1385. Exemplary rationales that may support a conclusion of obviousness include simple substitution of one known element for another to obtain predictable results.

In this case, the skilled artisan could arrive at the claimed invention by simple substitution of one known element for another. The prior art teaches a method which

Art Unit: 1623

differs from the claimed method by the substitution of some components (oxidation of glucose, gold on carbon support) with other components (oxidation of maltose, gold on metal hydroxide support). Gold catalysts on metal hydroxide supports, used in oxidation reactions, are known in the art as an alternative to gold on carbon. Gold catalyst is known in the art as an attractive alternative to platinum or palladium catalyst, and has been used to oxidize glucose. Oxidation of maltose, which is a disaccharide formed from two glucose molecules, using platinum or palladium catalyst is known in the art. Thus, the skilled artisan could have substituted maltose for glucose, or metal hydroxide solid support for carbon solid support, and would have predicted similar results because these are all known in the art as alternatives.

Response to Arguments

Applicant presents the second declaration of Dr. Alirez Haji-Begli. The declaration shows % conversion over time and activity over a number of batches for the method of the claimed invention. It is noted that it is not clear which metal oxide support was used in the experiments. The data is sufficient to establish that, under specific conditions, gold on the metal oxide catalyst used is more durable than gold on carbon. According to the declaration, the conditions used were glucose substrate, 1% gold catalyst, 4% by weight of glucose, glucose/gold ratio 1000, pH=9.5, and temperature = 50°C. However, the results are still not commensurate in scope with the claims. See MPEP 716.02(d): Whether the unexpected results are the result of unexpectedly improved results or a property not taught by the prior art, the "objective evidence of nonobviousness must be commensurate in scope with the claims which the evidence is

Art Unit: 1623

offered to support." In other words, the showing of unexpected results must be reviewed to see if the results occur over the entire claimed range. Many factors influence the oxidation of carbohydrates, as set forth in the previous action. Biella teaches the importance of pH in oxidations, Applicant's Table 4 shows that increasing the temperature beyond 40°C drastically affects the initial activity of the catalyst, Applicant's Table 5 shows that glucose concentration significantly affects the % conversion and initial activity, and Applicant's Examples 4 and 5 illustrate that oxidation of two different disaccharides proceed differently than oxidation of maltose. Prati's teachings show that catalyst activity differs among different metal oxide supports. The broadest claim contains no limitations with respect to pH, temperature, glucose concentration, and metal oxide catalyst. Because of all these factors, it is impossible to determine whether the results occur over the claimed range (which is very broad as set forth above).

Applicant argues that the prior art evidenced strong prejudice against the use of metal oxide rather than carbon, and that Prati shows that metal oxide-support catalysts exhibit a lower selectivity toward oxidation of ethane-1,2-diol as compared to carbon-supported gold catalysts. Prati's teaching is noted – different % conversion and different selectivity even among metal oxide catalysts. However, Biella shows that oxidation of diethyleneglycol using Au/TiO₂ catalyst gives similar selectivity and % conversion to the Au/C catalyst [see page 47, Table 5, NaOH/substrate=1]. Clearly, selectivity and % conversion depend also upon the substrate and the conditions used,

Art Unit: 1623

not only the catalyst support. Thus, there is no clear trend in the prior art which biases against metal oxide support.

For these reasons, the rejection is maintained.

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAYLA BLAND whose telephone number is (571)272-9572. The examiner can normally be reached on Monday - Friday, 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anna Jiang can be reached on (571) 272-0627. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 10/555,714
Art Unit: 1623

Page 8

/Layla Bland/
Examiner, Art Unit 1623